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ABSTRACT

Studies were conducted locally to augment findings from the literature regarding the effect of school entrance age, and to examine several other issues related to the St. Louis Public School's kindergarten screening program. Studies reported address a number of questions related to program planning and policy development: (1) Is there evidence to suggest that entrance age affects children's achievement, retention in grade, and assignment to special education? (2) Does participation in a preschool program lead to higher performance on the screening test and a reduction in the number of children who do not meet the screening criteria? (3) Among children who did not meet the early entry screening criteria for the 1986-87 school year, what percentage entered a preschool or day care program? and (4) Were children who did not meet the screening criteria for the 1985-86 school year better prepared for kindergarten at the beginning of the 1986-87 school year? After summary reviews of the studies, alternatives for addressing the issue of early entrance are discussed. Discussion focuses on changing of the screening cutoff score, program alternatives, provision of an extra prekindergarten year, curriculum and instruction, and kindergarten staffing. A list of appropriate and inappropriate educational practices for 4- and 5-year-old children is appended. (RH)

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THE KINDERGARTEN SCREENING PROGRAM

RESEARCH FINDINGS AND RELATED ISSUES

1986-87

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THE KINDERGARTEN SCREENING PROGRAM

RESEARCH FINDINGS AND RELATED ISSUES

1986-87

June 1987

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INTRODUCTION

This report provides a brief summary of recently completed studies related to the kindergarten screening program. It also provides a discussion of alternatives related to meeting the needs of kindergarten pupils. The first three studies investigated the effect of kindergarten entry age on retention, achievement, and special education referral. The fourth study examined the effect of formal pre-kindergarten schooling on test performance during the 1986-87 kindergarten screening. The fifth study followed up on children who had not met the screening criteria for the 1986-87 school year. The sixth study examined the level of readiness this year of children who did not meet the kindergarten screening criteria for the 1985-86 school year.

BACKGROUND

As a result of Missouri House Bill 463, the entry age for kindergarten and first grade has been increased. Previously, children who became five by September 30th were eligible to enroll in kindergarten. However, beginning in the 1985-86 school year, the entry age was to be increased by one month each year for three years. To be age eligible for kindergarten, a child would have to be five before September 1st for the 1985-86 school year, before August 1st for the 1986-87 school year, and before July 1st for the 1987-88 school year. While the bill increased the age eligibility level for kindergarten and first grade, it required school systems to establish assessment procedures to

determine the readiness of children whose birthdays met the old age criteria, but not the new criteria. If these children meet the assessment criteria they may enter kindergarten or first grade.

The bill only requires school systems to provide readiness testing for these age-ineligible children upon the parents' request. However, the St. Louis Public Schools (SLPS) decided to offer the assessment to all age-ineligible children as part of a comprehensive screening program of entering kindergarteners. (During screening for the 1986-87 school year the program included speech, hearing and vision screening as well as readiness testing.)

The screening program began in August, 1985. The Missouri Kindergarten Inventory of Developmental Skills (KIDS) was used as the screening instrument. The criterion for acceptance into kindergarten was set at a fairly minimal level. (September birthday children must score at or above the 25th percentile on 3 of the 6 KIDS subtests, including Gross-motor Skills.) Approximately 14% of the September birthday children did not meet the screening criterion.

A study was conducted during Spring, 1986 in which kindergarten pupils' screening scores were compared to their end-of-year readiness for 1st grade (as determined by their teacher.) As a result of this study, the criterion for acceptance into kindergarten for the 1986-87 school year was made slightly more stringent. (August and September birthday children must score above the 25th percentile on 3 of 5 KIDS subtests, excluding

Gross-motor Skills.)

Because of the more stringent criterion, about 22% (164 of 746) August and September birthday children who were tested did not score high enough to be accepted into kindergarten for the 1986-87 school year. If the same criterion is used next year, it can be predicted that approximately 245 July, August, and September birthday children will not be accepted for kindergarten for the 1987-88 school year.

The change in age eligibility enacted by the State of Missouri is part of a nationwide trend to raise the kindergarten entry age. Eads and Walsh (1986), for example, reported that in 1958 the most common cutoff dates in the country were December 1 or January 1 of the school year. By 1985, only 20% of the states had cutoff dates later than November 30th, and more than one-half of the states had cutoff dates of October 1 or earlier. However, maturation is no guarantee that children will be better prepared for kindergarten. In response to this fact, openings were made available in the St. Louis Public Schools' preschools for those children who did not meet the screening criterion.

LITERATURE REVIEW

The premise that younger children will generally be less successful in school than their older peers is supported by a fairly large number of prior studies. Weinstein (1968-69) pointed to nine studies which had found that among children who entered first grade under normal conditions (had not repeated, entrance had not been delayed by parents, or had not been admitted early by special screening) those who had entered first

grade at the younger end of the age range received lower school marks and scored lower on achievement tests than did those at the older end of the range (Bigelow, 1954; Carroll, 1963; Carter, 1956; Dickinson and Larson, 1963; Green and Simmons, 1962; Halliwell and Stein, 1964; Hamahinen, 1952; Johnston, 1964; and King, 1955). These earlier studies found that the deficit lasted throughout the twelve public school years. Weinstein also cited a number of studies (Cone, 1955; Handy, 1938; Hobson, 1948; Miller, 1957; and Reynolds, 1952) which found that younger children who had been screened for mental, social, emotional, and physical maturity did at least as well academically as older unscreened normal entrants.

The most recent review of research was provided by Shepard and Smith (1986). They referred to additional studies that had found a significant relationship between entry age and school success (e.g., Davis, et al., 1980; Hall, 1963; and Langer, et al., 1984). That is, younger students did not tend to do as well as older students.

Standardized achievement test results are major indicators of student success. Shepard and Smith (1986) found average differences of nine percentile points in reading and six percentile points in mathematics between first graders who were in the youngest three-month group and the oldest three-month group in their class. Davis, Trimble, and Vincent (1980) found that pupils who were six when they entered first grade were, on average, nine percentile points ahead of children who were five when they started first grade. Some studies have found that

differences diminish as children progress in school. Shepard and Smith (1985), for example, reported no difference in reading and mathematics achievement in third or fourth grade. Langer, Kalk, and Searls (1984) found that differences had largely disappeared by the time students reached age 17.

Another major indicator of school success used for comparing younger and older children is grade retention. In a study carried out in the Hebron, Nebraska Elementary School, Uphoff (1985) found that summer children, born between June 1 and October 15, made up 23 percent of the population, but accounted for 75 percent of the school's failure population. Langer, Kalk, and Searls (1984) also found significant differences in retention rates when they analyzed national samples of 9-, 13-, and 17-year-old students.

One complication in using retention rates as an indicator of school success when examining school entrance-age effect is that teachers and administrators may be more willing to retain younger children. For example, Shepard and Smith (1985) found evidence that age was an important consideration among teachers in deciding to retain kindergarteners. Sixty-eight percent of kindergarten teachers in their sample indicated they would give important weight to age in recommending retention or promotion.

A few studies have associated other indicators of school success with entrance age. DiPasquale, Moule, and Flewelling (1980) found a significant correlation between entry age and academic special education referrals among students in York County, Ontario. The birthdate effect was observed for primary grade boys, but not for primary grade girls (p. 237). Diamond

(1983) found a high positive correlation between percentages of learning disabled children and birth month among students in Hawaii. Differences were significant for both boys and girls.

A major point made by some researchers is that the birthdate effect is relative rather than absolute. They argue that younger children will always be at some disadvantage, regardless of their absolute age. Studies in other countries give some support to this argument. For example, in cautioning against thinking in absolute terms, Gredler (1980) referred to two different studies. One study in Sweden (Malmquist, 1958) referred to difficulties of "younger" first graders who were seven years old, the age of compulsory attendance. Another study (Jinks, 1964) found that younger children in Great Britain did not do as well as older children. However, the "older" children in Great Britain were about the same age as the younger children in North America. Because of these findings, it has been argued that raising the entrance age would provide only a temporary solution to the birthdate effect (Shepard and Smith, 1986, p. 82).

Some researchers have argued that the key to reducing the birthdate effect is to modify the curriculum to accommodate differences in children's levels of readiness. Miller and Norris (1967) attributed a lack of differences between youngest and oldest children on readiness measures at 2nd, 3rd, and 4th grades to the effectiveness of an ungraded program in which teacher expectations were individualized. Weinstein (1968-69, p. 27) asserted that "any system which would narrow the gap between what the younger entrant can do and what is expected of him should

serve to lower the probability of persistent behavioral and academic problems."

In summarizing their own work, Vail and Price (1984) pointed out that finding a birthdate effect does not explain the effect. They stated: "It is conceivable, for instance, that non-essential aspects of school practice inadvertently penalize the younger child. Were this found to be true, changing those school practices would be as reasonable to recommend as restricting early kindergarten entry (p.6)."

RESEARCH QUESTIONS

Studies were conducted locally to augment findings from the literature regarding the effect of school entrance age, and to examine several other issues related to the kindergarten screening program.

The studies reported here address a number of key questions related to program planning and policy development.

1. Is there evidence to suggest that entry age affects achievement, retention, and special education assignment among SLPS students?

2. Does participation in a preschool program lead to higher performance on the screening test and a reduction in the number of children who do not meet the screening criteria?

3. Among children who did not meet the early entry screening criteria for the 1986-87 school year, what percentage entered a preschool or daycare program?

4. Is there evidence that children who did not meet the screening criteria for the 1985-86 school year were better prepared for kindergarten at the beginning of this school year?

After reviewing results of these studies, alternatives for addressing the issue of early entry will be discussed.

METHODS

A number of data collection and analysis procedures were used. These are briefly described below for each study.

Entrance Age

Three separate studies examining the effect of entrance age on school success were conducted. In all three studies students were grouped by birth-quarters (1st=September, August, and July; 2nd=June, May, and April; 3rd=March, February, and January; 4th=December, November, and October). Children who became five years of age in the first birth-quarter were the youngest. (These children are sometimes referred to as "Summer Children".)

The first study examined the effect of entrance age on kindergarteners' predicted readiness for first grade, as judged by teachers. The sample consisted of one randomly selected kindergartener from each birth quarter attending each kindergarten class during the 1985-86 school year. A total of about 700 pupils were included in the sample. Teachers were sent a brief questionnaire for each of the four children in their class. They were asked to rate the children's readiness for first grade in terms of general readiness and in the areas of mathematics, prereading, oral language, and social maturity. A five-point scale from "very low" to "very high" was used.

The second study examined the effect of kindergarten entrance age on students presently enrolled in the St. Louis Public Schools who had been first-time kindergarteners in 1979-80. Appropriate statistical analyses were carried out to examine the effect of kindergarten entrance age on retention, achievement and special education assignment. Standard scale scores for the California Achievement Test (CAT) were used for measuring achievement. This score allows comparisons among students regardless of their present grade placement.

The third study was carried out to determine if the system-wide full-day kindergarten program first implemented during the 1984-85 school year lessened the effect of entrance age on achievement and retention. Retention rates and achievement, as measured by the CAT, of first time kindergarteners in 1983-84 were compared to first time kindergarteners in 1984-85.

Pre-Kindergarten Experience

The population used for this study included those children who were screened for kindergarten for the 1986-87 school year. During screening, information regarding formal pre-kindergarten schooling was obtained for each child (no preschool/daycare, day care, non-SLPS preschool and SLPS preschool). Average KIDS sub-

test scores (NCEs) were calculated for each group for the entire population. Additional analyses were carried out for age-ineligible children.

Below 1986-87 Cutoff

The population for this study included those children born in August and September, 1981 who had not met the enrollment criteria for the 1986-87 school year. A phone survey was conducted to determine the status of the children; whether or not they were receiving any kind of formal pre-kindergarten schooling.

Below 1985-86 Cutoff

The population for this study included those children who had not met the screening criteria for the 1985-86 school year and who were enrolled in a SLPS kindergarten. Information regarding their level of readiness was obtained from kindergarten teachers and information regarding formal pre-kindergarten schooling during the 1985-86 school year was obtained from parents through a phone survey.

FINDINGS

Findings are presented under the following categories: 1. The Effect of Entrance Age on School Achievement; 2. The Effect of Pre-Kindergarten Experience on Screening Scores; 3. Schooling Status of Children who Scored Below the 1986-87 Cut-off; and 4. Kindergarten Readiness of Pupils who Scored Below the 1985-86 Cutoff.

1. The Effect of Entrance Age on School Achievement

OVERALL, KINDERGARTEN TEACHERS RATED OLDER PUPILS HIGHER IN TERMS OF GENERAL READINESS AND IN THE AREAS OF MATHEMATICS, PREREADING, ORAL LANGUAGE AND SOCIAL MATURITY.

As described above, kindergarten teachers were asked to rate a sample of their pupils in terms of readiness for first grade during Spring, 1986. The frequencies of ratings for general level of readiness are presented in Table 1. As shown, about 27.0% of 1st birth-quarter pupils were rated as either low or very low. The percentages of the 2nd, 3rd, and 4th birth-quarter pupils receiving a rating of low or very low were 22.4%, 16.1%, and 15.8%, respectively.

Table 1
End-of-Year Predicted General Level of Readiness for First Grade

		Level of Readiness				
Birth-Quarter	N	Very Low %	Low %	Moderate %	High %	Very High %
1st	174	6.9	20.1	32.8	31.6	8.6
2nd	174	9.8	12.6	36.2	29.9	11.5
3rd	180	7.2	8.9	36.7	26.7	20.6
4th	171	3.5	12.3	30.4	33.3	20.5
Total	699	6.9	13.5	34.1	30.3	15.3

There was also a difference between birth-quarters in terms of receiving ratings of high or very high level of readiness. The percentages of 1st, 2nd, 3rd, and 4th birth-quarter pupils who were rated either high or very high were 40.0%, 41.4%, 47.3% and 53.8%, respectively.

Although there was a difference in predicted level of readiness in each of the specific areas addressed, the greatest difference was in social maturity. As shown in Table 2, 30% of 1st birth-quarter pupils were rated as either low or very low in terms of social maturity. In contrast, corresponding percentages of 2nd, 3rd, and 4th birth-quarter pupils were 19.5%, 14.0%, and 15.0%.

Table 2
Percent of Kindergarteners Ranked by Teachers as Low or Very Low in Terms of Readiness for First Grade

Birth-Quarter	Math	PreRd	OrLang	SocMat
1st	26.0	27.5	21.0	30.0
2nd	19.5	25.8	21.0	19.5
3rd	16.0	17.7	12.0	14.0
4th	14.0	18.0	15.0	15.0

AMONG STUDENTS WHO HAD ENTERED A SLPS KINDERGARTEN DURING THE 1979-80 SCHOOL YEAR AND WHO WERE ENROLLED IN THE SLPS IN FALL 1986, CHILDREN WHO ENTERED KINDERGARTEN AT YOUNGER AGES TENDED TO HAVE HIGHER RETENTION RATES AND LOWER ACHIEVEMENT. ENTRANCE AGE WAS NOT RELATED TO SPECIAL EDUCATION ASSIGNMENT.

There was a clear relationship between entrance age and retention. As shown in Table 3, 58% of students born in the 1st birth quarter were retained one or more years while 40% of students born during the 4th birth-quarter were retained one or

more years. If these students had made normal progress, they would be in the 7th grade during the 1986-87 school year. In actuality, only 42% of 1st birth-quarter students compared to 60% of 4th birth-quarter students are in 7th grade this year.

Table 3
Retention Rate of Students Presently Enrolled in SLPS Who Were First-Time Kindergarteners in 1979-80 and Who Have Never Received a Special Education Assignment

Birth-Quarter	N	Years Retained 1 %	2 %	3 %	Retained 1 or more years %
1st	385	36	18	4	58
2nd	322	38	14	1	53
3rd	354	32	13	1	46
4th	337	30	09	1	40

There was also a clear relationship between birth-quarter and achievement as measured by the California Achievement Test. Table 4 provides Spring, 1986, standard scale scores of students who were first-time kindergarteners in 1979-80.

Table 4
Spring 1986 CAT Standard Scale Scores of SLPS Students Who Were First-Time Kindergarteners in 1979-80

Birth-Quarter	N	Read Total	Lang Total	Math Total	Battery Total
1st	380	468	517	479	474
2nd	313	478	529	488	485
3rd	342	485	535	492	491
4th	341	485	536	498	493
Total	1376	479	529	489	485
Norm (NCE=50)*					
5th grade		474	505	466	469
6th grade		502	525	494	497

*CAT Norms Tables, Early Spring Scale Scores to NCE were used.

If these students had made normal progress, they would have been 6th graders during the 1985-86 school year. The mean scores for the 5th and 6th grade national norming population are provided for comparison. The scale score differences between 1st and 4th birth-quarters averaged 17 points in Reading Total and 19 points for the other two subtests and for the Battery Total. Overall, average scores of 1st birth-quarter students were approximately two-thirds of a year behind those of 4th birth-quarter students.

The effect of birth-quarter is also reflected in Table 5 which provides the percentage of students who scored at or above the 6th grade scale score average.

Table 5
Percent of 1979-80 First-Time Kindergarten Students
At or Above 6th Grade Scale Score Average on CAT, Spring 1986
Regardless of Actual Grade Placement

Birth-Quarter	Read Total %	Lang Total %	Math Total %	Battery Total %
1st	28	48	43	40
2nd	36	53	48	45
3rd	38	57	53	49
4th	39	55	56	47
All	35	53	50	45

In reading, 28% of 1st birth-quarter students compared to 39% of 4th birth-quarter students scored above the mean. In both Language and Math Total more than half of the 4th birth-quarter students, but less than half of the 1st birth-quarter students scored above the mean (55% vs. 48% and 56% vs. 43%). In Total Battery, the difference was 47% compared to 40%.

There was no apparent relationship between birth-quarter and special education assignment. As shown in Table 6, the percentage of students assigned to special education ranged from 10.7% for the 1st birth-quarter to 12.3% for the 2nd birthquarter. There was no consistent pattern, and the differences were almost certainly due to chance.

Table 6
Percentage of 1979-80 First-Time Kindergarteners Who Had Been Assigned to Special Education by Fall 1986

Birth-Quarter	N	Assigned Special Education %
1st	431	10.7
2nd	367	12.3
3rd	397	10.8
4th	384	12.2
All	1579	11.5

Not statistically significant.

IMPLEMENTATION OF THE SYSTEM-WIDE FULL-DAY KINDERGARTEN PROGRAM HAS APPARENTLY REDUCED THE OVERALL RETENTION RATE AND RAISED ACHIEVEMENT DURING THE FIRST TWO YEARS OF SCHOOLING. HOWEVER, OLDER CHILDREN CONTINUED TO HAVE LOWER RETENTION RATES AND HIGHER AVERAGE ACHIEVEMENT TEST SCORES THAN THEIR YOUNGER COHORTS.

The system-wide full-day kindergarten program was first implemented during the 1984-85 school year. This program was available for all kindergarteners. Before this time, a full-day kindergarten was available only for children who qualified for Chapter 1 remedial services. Approximately 1,000 kindergarteners (about one-fourth of the total) where served each year by this program. When the the system-wide full-day program was initiated, the Chapter 1 program was eliminated.

A comparison of retention rates and achievement of children who entered kindergarten the year prior to the full-day program to retention rates and achievement of children who entered the full-day program was made. Results of analyses indicated that the full-day program appeared to reduce retention rates and increase achievement for kindergarteners of all ages. However, there continued to be a significant difference between younger and older kindergarteners in both retention rates and achievement.

Differences in retention rates are shown in Table 7. Overall, the retention rate after two years in school was reduced from 24.2% to 21.0%. The greatest change was for children born in the 4th birth-quarter where the retention rate went from 18.1% to 12.0%, a difference of 6.1%. The change for 1st birth-quarter pupils went from 31.0% to 29.2%, a difference of 1.8%. Therefore, it can be seen that while the change to a full-day kindergarten reduced the retention rate, it made little difference for the younger children. In fact, the difference in retention rates between the youngest and oldest children widened.

Table 7
Retention Rate After Two Years of Students Who Were First-Time Kindergarteners in 1983-84 and 1984-85

	Half-day Kindergarten 83-84		Full-day Kindergarten 84-85	
Birth-Quarter	N	% Retained	N	% Retained
1st	878	31.0	869	29.2
2nd	673	25.6	739	22.2
3rd	683	20.7	802	19.2
4th	746	18.1	725	12.0
Total	2980	24.2	3135	21.0

The 4th birth-quarter pupils also appeared to gain most in terms of achievement test scores. The Total Prereading and Total Math NCE scores from the kindergarten level CAT are shown for the two cohorts in Table 8. As can be seen, the mean score for each birth-quarter increased for both prereading and mathematics. For the first three birth-quarters, the difference was 3-4 NCEs in reading and 5 NCEs in mathematics. However, average scores of 4th birth-quarter pupils increased by 7 NCEs in reading and 8 NCEs in mathematics.

Table 8
End of Kindergarten Total PreReading and Total Math NCE Scores for Pupils Entering Fall 1983 and Fall 1984

	Total PreReading		Total Math	
Birth-Quarter	1983-84 Half-day	1984-85 Full-day	1983-84 Half-day	1984-85 Full-day
1st	43	46	44	49
2nd	46	50	47	52
3rd	51	54	51	56
4th	51	58	53	61

N 83-84: R/M BQ1=1074/1100; BQ2=854/869; BQ3=868/893; BQ4=916/942
N 84-85: R/M BQ1=1117/1136; BQ2=981/957; BQ3=1041/1059; BQ4=962/971

The mean scores of 1st birth-quarter pupils were still slightly below the national norm of 50 NCEs after implementation of the system-wide full-day program. Average scores went up 3 NCEs in prereading and up 5 NCEs in mathematics. In contrast, average scores of 4th birth-quarter children went up 7 NCEs in prereading and 8 NCEs in mathematics.

An analysis of scale score differences after two years indicated that the the oldest pupils continued to benefit most from the full-day kindergarten program. These results are shown in Table 9. (Scores for children who entered kindergarten in 1983 were from Spring, 1985, while scores for children who entered kindergarten in 1984 were from Spring, 1986.)

Table 9
Spring CAT Standard Scale Scores of Students Who Had Completed Two Years in the SLPS and Who Were First-Time Kindergarteners in 1983-84 or 1984-85

	Total Reading		Total Math	
	1983-84	1984-85	1983-84	1984-85
Birth-Quarter	Half-day	Full-day	Half-day	Full-day
1st	297	297	310	311
2nd	300	302	314	315
3rd	304	309	318	321
4th	308	314	321	326
Norm (NCE=50)				
Kg	242*	237**	276*	274**
1st	314*	308**	318*	314**

N 83-84: R/M BQ1=923/934; BQ2=725/730; BQ3=791/742; BQ4=786/789
N 84-85: R/M BQ1=949/951; BQ2=799/803; BQ3=888/888; BQ4=821/820

*CAT Norms Tables-Late Spring Scale Score to NCE, pp. 1-5.

**CAT Norms Tables-Early Spring Scale Score to NCE, pp. 57-61. (Different norms appear for each cohort because the Spring 1985 CAT was given later in the school year than the Spring 1986 CAT.)

In reading, pupils in all four birth-quarters who had been in the half-day kindergarten program were below the first grade norm. First birth-quarter pupils in the half-day program were 17 points below, while fourth birth-quarter pupils were 6 points

below the first grade norm. Pupils in all birth quarters who had been in the full-day kindergarten program gained in relation to the norm. However, first birth-quarter pupils remained below the norm while third and fourth birth-quarter pupils scored above the norm.

A similar pattern existed for mathematics. Among those who had attended the half-day program, first birth-quarter pupils were 8 points below the first grade norm, while fourth birth-quarter pupils were three points above the norm. Among those who had attended the full-day program, first birth-quarter pupils averaged three points below the norm, while fourth birth-quarter pupils averaged 12 points above the norm.

2. The Effect of Pre-Kindergarten Experience on Screening Scores

STUDENTS WHO HAD SOME FORM OF PRE-KINDERGARTEN SCHOOLING PERFORMED CONSIDERABLY HIGHER ON THE KIDS THAN THOSE WHO HAD NOT ATTENDED A DAYCARE CENTER OR PRESCHOOL.

Mean KIDS NCE scores grouped on the basis of pre-kindergarten schooling are provided in Table 10.

Table 10
Mean NCE Scores on the KIDS Subtests
by Preschool Experience for 1986-87 Kindergarten Screening

		Mean NCE Scores for KIDS Subtests				
	N	Num	Aud	PaPN	Lan	Vis
No Preschool	1474	46	49	39	42	46
Daycare	479	52	56	47	47	52
Non-SLP Preschool	1376	54	57	49	48	54
SLP Preschool	542	53	60	51	50	55

As shown in the table, children who had no preschool or daycare experience (about 38% of the total population) scored from 5 to 8 NCEs lower on the KIDS than children who had attended a day care center. They scored from 6 to 10 NCEs lower than children who had attended a non-St. Louis Public School Preschool, and from 7 to 12 NCEs lower than children who had attended a St. Louis Public School preschool.

The relationship of preschool experience to meeting the screening criteria for early entrance into kindergarten is clearly shown in Table 11. Of 416 children with August and September birthdays who had attended a preschool or daycare, only 12% failed to meet the criteria. However, 35% of the 330 children this age who had not had some formal pre-kindergarten schooling failed to meet the criteria.

Table 11
Percent of August and September Birthday Children Who Scored Below the Kindergarten Cutoff Score During the 1986-87 Kindergarten Screening

	Total	Below Cutoff
Preschool/Daycare	N	%
Yes	416	12
No	330	35

While these results clearly show that children who have participated in a preschool or daycare program perform better on the kindergarten screening instrument, we must be cautious in interpreting this finding. There might be other variables besides the preschool experience that account for some of the differences in screening test scores. For example, it is possible that a larger percentage of parents who send their children to a preschool provide other advantages to their children which affect school readiness.

3. Schooling Status of Children who Scored Below the 1986-87 Cutoff

APPROXIMATELY TWO-THIRDS OF THE CHILDREN WHO HAD NOT MET THE SCREENING CRITERIA FOR THE 1986-87 SCHOOL YEAR HAD SUBSEQUENTLY ENROLLED IN SOME OTHER FORMAL PROGRAM. THE MAJORITY OF THESE CHILDREN HAD ENROLLED IN A ST. LOUIS PUBLIC SCHOOL PRESCHOOL.

In an effort to ensure that children who did not meet the screening criteria would not have to wait a year before receiving services from the St. Louis Public Schools, a sufficient number of openings to accomodate these children were made available in our preschools. It was also anticipated that some children would enroll in programs outside the school system. A phone survey was conducted in October to follow up on children who had not met the screening criteria for 1986-87.

Results of the survey are presented in Table 12.

Table 12
Placement of Children Who Scored Below Cutoff Score on KIDS for the 1986-87 School Year

Program Entered	N	%
SLPS Preschool	46	42
Head Start	10	9
Private Preschool	6	5
Daycare	5	5
Private Kindergarten	2	2
Out-of-State Kindergarten	2	2
Total in a Program	71	65
No Program	39	35
	110*	100

*We were not able to contact 42 of 152 households.

One hundred ten of 152 households were contacted. Of the 110 children, 71 (65%) had enrolled in some other program. Forty-six of the children had been placed in one of the SLPS preschools, 10 had enrolled in Head Start, and 6 had enrolled in private preschools. Of the remaining 9, 5 were in day care programs, 2 in private kindergartens, and 2 in out-of-state kindergartens.

4. Kindergarten Readiness of Pupils who Scored Below the 1985-86 Cutoff

THE MAJORITY OF SEPTEMBER BIRTHDAY CHILDREN WHO HAD NOT MET THE SCREENING CRITERIA IN FALL, 1985 WERE STILL NOT PREPARED FOR KINDERGARTEN IN FALL, 1986. MANY OF THESE CHILDREN MIGHT BE IN NEED OF RECEIVING SPECIAL EDUCATION SERVICES.

Evidence in the literature and our own studies support the premise that kindergarten entrance age affects retention and achievement. At the same time, requiring those children who score very low on a screening test to wait a year before entering kindergarten may have little, if any, meaningful effect on their subsequent level of readiness the following years. This conclusion is based on results of a survey in which kindergarten teachers were asked to rate the level of readiness of September birthday children who had not met the screening criteria the previous year. In Fall, 1986, teachers were asked to rate these students using a five point scale in terms of general level of readiness for kindergarten. Ratings were obtained for 33 of 38 children who had enrolled in kindergarten. Results are provided in Table 13.

Table 13
Beginning of Year Readiness, Fall 1986
of September Birthday Children Who Scored Below the Cutoff
for the 1985-86 School Year

N	Very Low	Low	Moderate	High	Very High
	%	%	%	%	%
33	43	21	24	9	3

Teachers rated approximately two-thirds of these children as having either a low or very low level of readiness. Only 12% of the children were judged to be well prepared for kindergarten.

Parents were contacted to determine how many of these children had participated in a preschool or day care program. Information was obtained for 26 of the 33 children. As shown in Table 14, there was little difference in level of readiness between children who had participated in a program and those who had not participated. Eight of 14 children who had participated and 6 of 12 who had not participated were judged by the teachers to have a low or very low level of readiness for kindergarten.

Table 14
Beginning of Year Readiness by Pre-Kindergarten
Experience for September Birthday Children Who Scored Below
the Cutoff for the 1985-86 School Year

	Teacher Rating					
	Very Low	Low	Moderate	High	Very High	Total
Preschool	5	2	4	1	1	13
Daycare	1	-	-	-	-	1
None	4	2	5	1	-	12
Total	10	4	9	2	1	26

Although the number of children in the analysis was small, these results indicate that denying admission to kindergarten will not ensure readiness the following year for those children who score very low on the screening test. The results also indicate that many of these children will still be unprepared for kindergarten even if they attend a preschool or daycare program.

A sizable proportion of those pupils who were not prepared for kindergarten, even after delaying entrance for a year, might be in need of supplemental services. As discussed earlier, these children made up the lowest 14% of September, 1980, birthday children who had taken the KIDS. Approximately 8.5% of the total SLPS enrollment is classified as being educationally mentally retarded or as learning disabled. If this percentage is applied to kindergarten, then possibly more than half of the children who had not met the early entrance criteria will eventually be referred for special education services. Follow-up screening and/or a multi-disciplinary evaluation during the kindergarten screening program should help to ensure that we identify these children and then provide them with the most appropriate services.

SUMMARY AND DISCUSSION

Results, both of studies reported in the literature and those carried out locally, point to the fact that school entrance age does affect success in school. Our own analysis indicated that kindergarten teachers rated older children higher in terms of general readiness for 1st grade and in terms of prereading, oral language and social maturity. Younger children continue to be at a disadvantage in terms of making normal grade progression and achievement even after seven years of school enrollment.

Introduction of the system-wide full-day kindergarten appears to have raised achievement test scores and reduced retention rates. However, it has not closed the achievement gap between younger and older students. In fact, analysis of CAT scores indicated that the full-day program was more beneficial for older children than for their younger classmates. The fact that older children gain most from the full-day program might be due their greater maturity. They may be better able to maintain longer attention spans and be less apt to become overly tired in the afternoon.

Screening results indicated that children who had participated in a daycare or preschool program were better prepared for kindergarten than children who had not participated. Consequently, a larger proportion of age-ineligible children (born in August and September, 1981) who had some pre-kindergarten formal learning experience scored above the screening cutoff score for early entrance to kindergarten. This finding, plus the fact that more than a third of the children screened had not attended a day

care or preschool, suggests the need for more preschools in St. Louis.

The raising of the kindergarten entrance age is designed to help children who could benefit by gaining in maturity before entering kindergarten. However, simply requiring children to wait a year would not necessarily provide them with readiness experiences that could be critical for kindergarten and beyond. Therefore, a sufficient number of openings in SLPS preschools were made available to potentially serve all children who had not met the screening criteria for Fall, 1986. Many of these children did enroll in either a SLPS preschool, Head Start, or a private preschool. However, about a third of the children did not enroll in a program by October.

A substantial proportion of children who had not met the kindergarten screening criteria for the 1985-86 school year were still not prepared for kindergarten in Fall, 1986. Additionally, attendance at a preschool or daycare during the previous year did not ensure their readiness for kindergarten. This indicates that maturity might not be a major factor in determining readiness when the cutoff score is set at a fairly low level. It is probable that many children who did not meet the screening criteria will require some type of special education services. There is a need, therefore, to provide follow-up screening and, if warranted, multi-disciplinary evaluations for children who score very low on the initial screening test.

Given the findings reported here and in the literature, we can briefly review some alternatives for addressing the needs of our students. The first set of alternatives is related to

adjusting the cutoff score for early entrance into kindergarten, and the second set is related to program alternatives.

Screening Cutoff Score

One option would be to raise the cutoff score so that only the most well prepared children with summer birthdates would qualify for kindergarten. Even if no other services were made available to children not selected, it would allow them to gain in maturity before entering kindergarten. While some children would not be significantly helped, some would profit from waiting a year. Raising the cutoff score would also decrease the number of retentions to some degree. While this would cause a drop in the 1987-88 enrollment, the enrollment for following years would not be reduced since the children would simply enter one year later.

Another option would be to modify the screening criteria so that essentially all children would be admitted to kindergarten. A major advantage of this option is that we could ensure that all children receive some services from the school system. In addition to receiving regular kindergarten services, children could be provided supplemental services if further diagnosis indicated the need. If children are kept out a year, the opportunity for further diagnosis may be delayed.

Although openings were made available in SLPS preschools for children who had not met the screening criteria, many of these children did not participate. One reason they did not enter a preschool is that only a limited number of sites (28) are available, while kindergartens are in 69 schools. Since transpor-

tation is not provided to preschoolers, they must normally live close to one of the preschool facilities. Also, if these children are enrolled in kindergarten, they will not displace younger children who want to enroll in the preschools.

The third option is to keep the screening criteria the same, at least for the 1987-88 school year. This would allow the large majority of age-ineligible children to enter kindergarten, and would ensure that most of these children who enter kindergarten will meet with at least moderate success. Many of those children not admitted would enroll in some alternative program as they did this year. Keeping the same criteria would also reduce the potential for confusion among school system staff and among parents.

Program Alternatives

A number of program alternatives are available. Three major categories of alternatives are: (1) providing an extra year of schooling for children who are not ready, (2) modifying the curriculum and instructional practices, and (3) supplementing the present staffing in kindergartens. While there might be other appropriate options to consider, these three will be considered here.

Providing An Extra Year

A number of options are potentially available if the school system decides to provide an extra year for children who are not ready for first grade. The first option is to provide preschools for age ineligible children who do not meet the screening cri-

teria. This is what we have done during the 1986-87 school year. The advantage of this option is that we are able to provide services to at least a portion of these children without increasing program costs. As mentioned before, a major disadvantage of this option is that these children displace others who have applied to enroll in preschool. Also, many of the children will not be able to attend because a preschool will not be close to their home or because their parents choose not to enroll them.

Another option is to provide an extra year of kindergarten for children who are not ready for first grade. This can be done by simply having children repeat the regular kindergarten curriculum, or by establishing transitional kindergartens. Transitional kindergartens would provide a modified-curriculum aimed at bridging the gap between kindergarten and first grade. Either this or the preschool option should allow younger children an opportunity to develop greater maturity, and might help to reduce school failure in the first grade and beyond.

Some researchers have argued that retention of any kind does not have a long-term effect. For example, Shepard and Smith (1986) summarized the findings of two recent studies by Holmes and Matthews (1984) and Rose, et al. (1983) by stating: "...research findings are almost uniformly negative. When retained children were compared to equally low achievers who were promoted, the socially promoted pupils were consistently ahead on both achievement and social-emotional measures (p. 84)."

Shepard and Smith (ibid.) also referred to a review by Gredler (1980) of five recent studies that examined the effect of transitional or pre-first grade classes. In four of the five

studies, it was found that children placed in the transition rooms were no better off than potential failures who had been put into a regular first grade. In the one study which found positive results for children after a year in the transitional room, the benefit was no longer apparent by the third grade (Raygor, 1972).

Curriculum and Instruction. Modifications in curriculum and instruction might be a key to successfully addressing the variation in readiness of entering kindergarten pupils. Miller and Norris (1957) for example, attributed a lack of differences between youngest and oldest children on readiness measures at 2nd, 3rd, and 4th grade to the effectiveness of an ungraded program in which teacher expectations were individualized. Weinstein (1968-69) suggested that narrowing the gap between what the younger entrant can do and what is expected of him would serve to lower the probability of persistent behavioral and academic problems (p.26). After finding differences in academic achievement between younger and older kindergarten entrants, Vail and Price (1984) suggested that non-essential aspects of school practices might inadvertently penalize the younger child, and that changing those practices would be as reasonable to recommend as restricting early kindergarten entry (p. 6).

The National Association for the Education of Young Children has recently published a position statement on developmentally appropriate practices in programs for 4- and 5-year-olds (NAEYC, 1986). The statement was published because of the association's concern regarding: "...the increasingly widespread demand for

use of inappropriate formal teaching techniques for young children, over-emphasis on achievement of narrowly defined academic skills, and increased reliance on psychometric tests to determine enrollment and retention in programs (p. 20)." They have provided a detailed comparison of "appropriate" and "inappropriate" practices. These are included in the Appendix of this paper, and could be used as a guide for examining curriculum and instruction in the St. Louis Public Schools' kindergarten program.

Kindergarten Staffing

The St. Louis Public Schools have made significant progress in reducing class size. Despite budget limitations, the pupil/teacher ratio goal of 20/1 has been reached in some kindergartens and nearly reached in many others. In order to adequately meet the needs of our kindergarteners, it might be necessary to further reduce the pupil/teacher ratio. The National Association for the Education of Young People, for example, has stated that, in order to enable age-appropriate programming, four- and five-year-olds should be in groups of no more than 20 children with two adults (Ibid, p. 27).

If the pupil/adult ratio is to be further reduced, the most cost-effective approach would probably be the addition of qualified instructional aides. Aides have been used in past kindergarten programs. Before the system-wide full-day kindergarten was initiated in 1984, many SLPS kindergarteners received additional half-day services through the Title I Kindergarten Extended Day (KED) Program. This program provided an extra half-

day instruction to groups of 15 children who were identified as being in need of the services. Each KED classroom was staffed by a teacher and an aide, thus providing a pupil/adult ratio of less than 8/1. The addition of an instructional aide would reduce the pupil/adult ratio to approximately 10/1, as called for by the NAEYC.

Adding instructional aides would, of course, require additional funding, as would some other alternatives such as pre-kindergarten or transitional kindergarten programs. This might require modifications in other programs. For example, if instructional aides are funded through Chapter 1 (formerly Title I), cuts in other Chapter 1 programs might be required. Given the potential benefit of further reducing kindergarten class size, it would seem appropriate to begin examining funding alternatives.

CONCLUSION

In conclusion, there is strong evidence both in the literature and from our own studies that younger children will be less successful in school than their older classmates. There is also evidence that, to some degree, this age effect is relative. There will always be a younger group of children, regardless of the entrance cutoff age. The major question is: "How can we best meet the needs of these younger children?"

Requiring an additional year before entering kindergarten should help those children who are less developmentally ready. It will not, however, help children who are in need of special services. Waiting a year will also be of little benefit to children who are not being provided appropriate readiness experiences in the home. It is critical, therefore, that we continue to try to provide the most appropriate services to all potential kindergarten pupils. It is also critical that we examine our present curriculum and staffing configuration to ensure that we provide the best possible services to our kindergarten pupils.

RECOMMENDATIONS

In light of the above findings, the following recommendations are made under the categories of "screening" and "instructional planning."

Screening

1. CONTINUE WITH THE SAME BASIC CRITERIA FOR ACCEPTANCE OF SUMMER BIRTHDATE CHILDREN INTO THE REGULAR KINDERGARTEN PROGRAM.

2. PROVIDE SUPPLEMENTAL SCREENING FOR SUMMERBIRTHDATE CHILDREN WHO DO NOT MEET THE CRITERIA. IF THE FOLLOW-UP SCREENING INDICATES THE CHILD MAY NEED SPECIAL SERVICES, A MULTI-DISIPLINARY EVALUATION SHOULD BE PROVIDED BEFORE THE START OF SCHOOL.

3. CONTINUE IN EFFORTS TO PLACE SUMMER BIRTHDATE CHILDREN WHO DO NOT MEET THE KINDERGARTEN SCREENING CRITERIA, AND WHO DO NOT NEED SPECIAL SERVICES, INTO ST. LOUIS PUBLIC SCHOOL PRESCHOOLS.

4. PROVIDE SPECIAL SERVICES FOR SUMMER BIRTHDATE CHILDREN WHO ARE DIAGNOSED THROUGH MULTI-DISCIPLINARY EVALUATIONS AS BEING IN NEED OF THESE SERVICES.

Instructional Planning

1. THE KINDERGARTEN IMPROVEMENT COMMITTEE SHOULD CONTINUE TO EXAMINE CURRICULUM ALTERNATIVES. EMPHASIS SHOULD BE GIVEN TO IDENTIFYING DEVELOPMENTALLY APPROPRIATE CONTENT AND INSTRUCTIONAL STRATEGIES.

2. AN ASSESSMENT INSTRUMENT CONSISTENT WITH THE CURRICULUM SHOULD BE IDENTIFIED OR DEVELOPED.

3. THE FEASIBILITY OF HIRING HIGHLY QUALIFIED INSTRUCTIONAL AIDES SHOULD BE EXAMINED BY THE KINDERGARTEN IMPROVEMENT COMMITTEE AND BY OTHER APPROPRIATE ADMINISTRATORS.

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APPENDIX A

Integrated Components of APPROPRIATE and INAPPROPRIATE Practice for 4- and 5-Year-Old Children

Component	APPROPRIATE Practice	INAPPROPRIATE Practice
Curriculum goals	• Experiences are provided that meet children's needs and stimulate learning in all developmental areas—physical, social, emotional, and intellectual.	• Experiences are narrowly focused on the child's intellectual development without recognition that all areas of a child's development are interrelated.
	• Each child is viewed as a unique person with an individual pattern and timing of growth and development. The curriculum and adults' interaction are responsive to individual differences in ability and interests. Different levels of ability, development, and learning styles are expected, accepted, and used to design appropriate activities.	• Children are evaluated only against a predetermined measure, such as a standardized group norm or adult standard of behavior. All are expected to perform the same tasks and achieve the same narrowly defined, easily measured skills.
	• Interactions and activities are designed to develop children's self-esteem and positive feelings toward learning.	• Children's worth is measured by how well they conform to rigid expectations and perform on standardized tests.
Teaching strategies	• Teachers prepare the environment for children to learn through active exploration and interaction with adults, other children, and materials.	• Teachers use highly structured, teacher-directed lessons almost exclusively.
	• Children select many of their own activities from among a variety of learning areas the teacher prepares, including dramatic play, blocks, science, math, games and puzzles, books, recordings, art, and music.	• The teacher directs all the activity, deciding what children will do and when. The teacher does most of the activity for the children, such as cutting shapes, performing steps in an experiment.
	• Children are expected to be physically and mentally active. Children choose from among activities the teacher has set up or the children spontaneously initiate.	• Children are expected to sit down, watch, be quiet, and listen, or do paper-and-pencil tasks for inappropriately long periods of time. A major portion of time is spent passively sitting, listening, and waiting.
	• Children work individually or in small, informal groups most of the time.	• Large group, teacher-directed instruction is used most of the time.
	• Children are provided concrete learning activities with materials and people relevant to their own life experiences.	• Workbooks, ditto sheets, flashcards, and other similarly structured abstract materials dominate the curriculum.

Component	APPROPRIATE Practice	INAPPROPRIATE Practice
	• Teachers move among groups and individuals to facilitate children's involvement with materials and activities by asking questions, offering suggestions, or adding more complex materials or ideas to a situation.	• Teachers dominate the environment by talking to the whole group most of the time and telling children what to do.
	• Teachers accept that there is often more than one right answer. Teachers recognize that children learn from self-directed problem solving and experimentation.	• Children are expected to respond correctly with one right answer. Rote memorization and drill are emphasized.
Guidance of socioemotional development	• Teachers facilitate the development of self-control in children by using positive guidance techniques such as modeling and encouraging expected behavior, redirecting children to a more acceptable activity, and setting clear limits. Teachers' expectations match and respect children's developing capabilities.	• Teachers spend a great deal of time enforcing rules, punishing unacceptable behavior, demeaning children who misbehave, making children sit and be quiet, or refereeing disagreements.
	• Children are provided many opportunities to develop social skills such as cooperating, helping, negotiating, and talking with the person involved to solve interpersonal problems. Teachers facilitate the development of these positive social skills at all times.	• Children work individually at desks or tables most of the time or listen to teacher directions in the total group. Teachers intervene to resolve disputes or enforce classroom rules and schedules.
Language development and literacy	• Children are provided many opportunities to see how reading and writing are useful before they are instructed in letter names, sounds, and word identification. Basic skills develop when they are meaningful to children. An abundance of these types of activities is provided to develop language and literacy through meaningful experience: listening to and reading stories and poems; taking field trips; dictating stories; seeing classroom charts and other print in use; participating in dramatic play and other experiences requiring communication; talking informally with other children and adults; and experimenting with writing by drawing, copying, and inventing their own spelling.	• Reading and writing instruction stresses isolated skill development such as recognizing single letters, reciting the alphabet, singing the alphabet song, coloring within predefined lines, or being instructed in correct formation of letters on a printed line.

APPROPRIATE Practice	INAPPROPRIATE Practice
• Children develop understanding of concepts about themselves, others, and the world around them through observation, interacting with people and real objects, and seeking solutions to concrete problems. Learnings about math, science, social studies, health, and other content areas are all integrated through meaningful activities such as those when children build with blocks; measure sand, water, or ingredients for cooking; observe changes in the environment; work with wood and tools; sort objects for a purpose; explore animals, plants, water, wheels and gears; sing and listen to music from various cultures; and draw, paint, and work with clay. Routines are followed that help children keep themselves healthy and safe.	• Instruction stresses isolated skill development through memorization and rote, such as counting, circling an item on a worksheet, memorizing facts, watching demonstrations, drilling with flashcards, or looking at maps. Children's cognitive development is seen as fragmented in content areas such as math, science, or social studies, and times are set aside to concentrate on each area.
• Children have daily opportunities to use large muscles, including running, jumping, and balancing. Outdoor activity is planned daily so children can develop large muscle skills, learn about outdoor environments, and express themselves freely and loudly.	• Opportunity for large muscle activity is limited. Outdoor time is limited because it is viewed as interfering with instructional time or, if provided, is viewed as recess (a way to get children to use up excess energy), rather than an integral part of children's learning environment.
• Children have daily opportunities to develop small muscles skills through play activities such as pegboards, puzzles, painting, cutting, and other similar activities.	• Small motor activity is limited to writing with pencils, or coloring predrawn forms, or similar structured lessons.
• Children have daily opportunities for aesthetic expression and appreciation through art and music. Children experiment and enjoy various forms of music. A variety of art media are available for creative expression, such as easel and finger painting and clay.	• Art and music are provided only when time permits. Art consists of coloring predrawn forms, copying an adult-made model of a product, or following other adult-prescribed directions.
• Children's natural curiosity and desire to make sense of their world are used to motivate them to become involved in learning activities.	• Children are required to participate in all activities to obtain the teacher's approval, to obtain extrinsic rewards like stickers or privileges, or to avoid punishment.

Component	APPROPRIATE Practice	INAPPROPRIATE Practice
Parent-teacher relations	• Teachers work in partnership with parents, communicating regularly to build mutual understanding and greater consistency for children.	• Teachers communicate with parents only about problems or conflicts. Parents view teachers as experts and feel isolated from their child's experiences.
Assessment of children	• Decisions that have a major impact on children (such as enrollment, retention, assignment to remedial classes) are based primarily on information obtained from observations by teachers and parents, not on the basis of a single test score. Developmental assessment of children's progress and achievement is used to plan curriculum, identify children with special needs, communicate with parents, and evaluate the program's effectiveness.	• Psychometric tests are used as the sole criterion to prohibit entrance to the program or to recommend that children be retained or placed in remedial classrooms.
Program entry	• In public schools, there is a place for every child of legal entry age, regardless of the developmental level of the child. No public school program should deny access to children on the basis of results of screening or other arbitrary determinations of the child's lack of readiness. The educational system adjusts to the developmental needs and levels of the children it serves; children are not expected to adapt to an inappropriate system.	• Eligible-age children are denied entry to kindergarten or retained in kindergarten because they are judged not ready on the basis of inappropriate and inflexible expectations.
Teacher qualifications	• Teachers are qualified to work with 4- and 5-year-olds through college-level preparation in Early Childhood Education or Child Development and supervised experience with this age group.	• Teachers with no specialized training or supervised experience working with 4- and 5-year-olds are viewed as qualified because they are state certified, regardless of the level of certification.
Staffing	• The group size and ratio of teachers to children is limited to enable individualized and age-appropriate programming. Four- and 5-year-olds are in groups of no more than 20 children with 2 adults.	• Because older children can function reasonably well in large groups, it is assumed that group size and number of adults can be the same for 4- and 5-year-olds as for elementary grades.